

Applicant: Doganowski et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 1387-10 PCT/US
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A. Amendments to the Specification:

- (1) Please add the following immediately after the title of the invention:

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is the National Stage of International Patent Application No. PCT/PL 03/00013, with an international filing date of February 20, 2003, which claims the benefit of Polish Patent Applications No. P-352643, filed March 6, 2002 and No. P-354371, filed June 10, 2002, the contents of which are incorporated herein by reference.

- (2) Please amend the section description "TECHNICAL FIELD" on page 1 as follows:

~~TECHNICAL FIELD~~ BACKGROUND OF THE INVENTION

- (3) Immediately after the above-mentioned "BACKGROUND OF THE INVENTION" on page 1, please add the following new paragraph, as follows:

1. Field of the Invention

- (4) Please delete section description "BACKGROUND ART" on page 1, as follows

~~BACKGROUND ART~~

- (5) Please add the following new paragraph immediately prior to the second full paragraph on page 1 which begins with "A management system ...", as follows

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2. Brief Description of the Background of the Invention Including Prior Art

(6) Please amend the section "AIM OF THE INVENTION" on page 1, as follows:

~~AIM~~ SUMMARY OF THE INVENTION

1. Purposes of the Invention

(7) Immediately after the third paragraph on page 1, which begins with "The invention seeks ...", please add the following new paragraph:

This and other objects and advantages of the present invention will become evident from the description which follows.

2. Brief Description of the Invention

(8) Please amend the section description "DISCLOSURE OF THE INVENTION" on page 1, as follows:

~~DISCLOSURE OF THE INVENTION~~

(9) Please add the following new paragraph immediately prior to the section header of "BRIEF DESCRIPTION OF DRAWINGS" on page 5, as follows:

The novel features which are considered as characteristic for the invention are set forth in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from

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the following description of specific embodiments when read in connection with the accompanying drawings.

(10) Please amend the section description "BEST MODE FOR CARRYING OUT THE INVENTION" on page 6, as follows:

~~BEST MODE FOR CARRYING OUT~~ DETAILED DESCRIPTION OF THE INVENTION
AND PREFERRED EMBODIMENT

(11) Please amend the seventh paragraph on page 3, as follows:

Preferably the identifying messages include a type of the ~~master decoding device and the slave decoding~~ devices, their version and/or their serial number.

(12) Please amend the fourth paragraph on page 4, as follows:

Preferably messages exchanged between the master decoding device and the slave decoding devices can contain additional messages generated by software installed in the decoding ~~device~~ devices or devices which are co-operating with them, or messages which are delivered to the decoding devices from outside sources.

(13) Please amend the description of Fig. 14 on page 5, as follows:

Fig. 14 illustrates a structure of a message sent between ~~two~~ set-top boxes;

(14) Please amend the last paragraph on page 10, as follows:

Figs 8A, 8B, 6C and 8D illustrate an algorithm of operation of the independent, or the master set-top box, which, when turned on, waits in step 82 for a message which is verified in step 83. Then, in step 84, it is checked whether the status of the master set-top box meets requirements of the coupling process. If the status of the master set-top box does not suit the coupling instruction, it returns to the waiting status. Subsequently, a check is made in step 87 as to whether the message is a request for coupling. A negative answer is followed by the return to the waiting status, whereas if the verification brings confirmation, a ~~probing~~ ping message is sent in step 89. In step 90 the status is examined, which should be the status of coupling with the slave set-top box. If so, in step 91 a threshold signal level is stored and the status of the slave set-top box coupled is allotted, followed by a message sent in step 92 to the coupled slave set-top box to enable video. The signal level is checked in step 93, and if it differs from the signal more than a permissible margin, the slave set-top box in step 94 is granted with a status of being disconnected, an error message is sent in step 95, and the master set-top box is returned to the waiting status. In step 97, a verification is carried out to decide if the time assigned for coupling has elapsed, and then in step 98 if the operating time has expired. Beginning from step 99, in steps 100, 101, and 102 the mode of each active set-top box is compared with the mode of the slave and connected set-top box, a verification process ends with a message sent to enable video display, whereas from step 103 the master set-top box is returned to the waiting status.

(15) Please amend the first full paragraph on page 11, as follows:

In case of a timeout of the master set-top box, in step 104, the verification process of each active slave set-top box is carried out, beginning with a ~~probing~~ ping message sent to the first slave set-top box in step 105, and then in step 106 a signal level is compared to a certain set level. The process of verification of the first active slave set-top box ends in step 111 and is carried starting with each next slave set-top box. If the difference in the signal level is not greater than an allowed margin, a new threshold signal level is stored in step 107, and in step 108 information to enable video display is sent. If the signal differs by more than the allowed margin, in step 109 the slave set-top box is granted with the status of non-connected, and an error message is sent in step 110.

(16) Please amend the first paragraph on page 12, as follows:

Figs 9A, 9B, and 9C illustrate an algorithm of sending a ping message to a chosen location within a network. First, in step 116 the following parameters are established: the maximum and constant number of steps, the maximum signal level which equals two raised to the power of the maximum step number, the signal power equal to half of the maximum signal power, the robustness having a constant value, and the step which equals unity. Next, a coupling message is sent in step 117 and receiving of message confirming the coupling takes place in step 118. In step 119 the time predicted to receive an answer to the ping message is verified. Calls for ping message repetitions are transmitted in step 114. If the waiting time predicted to receive confirmation of coupling is exceeded, in step 132 it is checked whether the robustness is greater

than zero, and in step 133 whether the step number is less than the maximum number of steps. For a negative answer the signal power is stored in step 134 and the process of sending the ping message ends in step 135. In step 136 the step number is increased, the signal power is established as equal to the maximum power divided by two raised to the number of incremental power steps, the initial robustness is set, followed by the repetition of sending the ping message. If the number of steps is less than the maximum number of steps, which is verified in step 140, the number of steps is increased in step 143, in step 144 the signal power is established as being equal to two raised to the number of incremental power steps, the initial robustness is set, followed by the repetition of sending the ping message. The robustness, set in step 144, is a parameter used to establish the number of ~~probing~~ ping operations which take place until communication is recognised as unsuccessful. For a step number not less than the maximum step number, the signal level is recorded in step 141 and the process of sending the ping message ends in step 142.

(17) Please amend the first full paragraph on page 13, as follows:

Figs. 11A and 11B illustrate states of set-top boxes within the broadcast network. At the moment of start, the mode and the status of each set-top box is not predetermined, which implies that the current mode and status are unknown. When the set-top boxes 174, 175, 176, 177, 178, 179, being in any state, receive a RCM 281, they change their state 172 to unknown. A set-top box being in unknown 172 state always sets itself into the undetermined 174 mode and initialises its operation. The set-top box operates in this state until it receives an entitlement message. If the

set-top box, being in the undetermined mode, receives the message 284 assigning the mode of acting as a master, the set-top box changes its mode to the 175 master set-top box in a ~~coupled~~ coupling state. When a message 285 assigning the mode of a master set-top box is received, the set-top box changes its mode 176 to that of a master set-top box in a coupled state, retaining this state as long as it is getting messages 286 about coupling. This status is changed when a reset coupling message 281 is obtained and then the set-top box changes its state 172 to undetermined mode and status.

(18) Please amend the second paragraph on page 14, as follows:

The access system to the broadcast network presented in fig. 12 comprises the master set-top box 11 and n slave set-top boxes 12, 15 linked to the master set-top box 11. The master set-top box 11 and the set-top boxes 12, 15 have four functional blocks, crucial for the system under discussion. Receiving and processing systems 251, 261, 271 are responsible for receiving a signal from the broadcast network 8. This signal is converted to ~~numerical values~~ digital form and is then sent for further processing. Processors 250, 260, 270 are responsible for the control of all the other systems 253, 263, 273 operating within one set-top box. For example, in fig.12, in the other systems 253, 263, 273, the systems 255, 265, 275 of access control were separated, and the other systems 254, 264, 274, which can be audio and video decoders, including those of MPEG and AC/3 format, systems generating graphics, systems generating audio and video output signals for a TV receiver, systems of memory (RAM, ROM, Flash, HDD), systems controlling ~~outer~~ external interfaces (keyboard, remote control unit), systems controlling a return

channel. Processors 250, 260, 270 execute software controlling the work of these systems and also control demultiplexers 252, 262, 272 operating ~~within~~ the private network 13 used to send ~~different information~~ various messages. The private network 13 can share physical media with the broadcast network 8 and in this case the demultiplexers 252, 262, 272 become an integral part of the receiving and processing system operating ~~within~~ the broadcast network 8.

(19) Please amend the third paragraph on page 14 as follows:

Fig. 12 illustrates an example of a way of message transmission between two systems of access control 255 and 265 of two different set-top boxes 11 and 12. In the situation illustrated in fig. 12, the access control system 255 of the master set-top box 11 transmits a message to the access control system 265 of the first slave set-top box 12. This message, generated by the application of the access control system 255, and then transmitted by the application of the demultiplexer 252, is transported over the private network 13. The transmitted message is received by the demultiplexers 262, 272 of the remaining set-top boxes 12, 15. The first slave set-top box 12, which received the message through the route ~~281~~ 293, accepts this message, while the n-th slave set-top box 15, which received this message through the route ~~282~~ 294, rejects it. Next, the application of the access control system 265 of the first slave set-top box 12 begins to process the message received from the access control system 255 of the master set-top box 11.

(20) Please amend the first full paragraph on page 15, as follows:

Fig. 13 presents an example of a way of message transmission between a device B 277 of the n-th slave set-top box 15 and an external device A 267 linked to the first slave set-top box 12 using an interface A 266 (for example a parallel port, an ~~outer~~ external IP network, a wireless connection i.e. Bluetooth or infra-red link, or a specific ~~connection~~ interface assigned to a given type of a device i.e. a Smart-Card ~~connection~~ interface). The device A 267 linked to the first set-top box 12 sends a message to the device B 277 which receives the message through the route ~~286~~ 296. Simultaneously, this message is sent using the route ~~285~~ 295 to the master set-top box 11 and is rejected because it is not dedicated to that set-top box.

(21) Please amend the second full paragraph on page 15 as follows:

An exemplary format of a message sent between ~~two~~ set-top boxes is presented in fig. 14. Only the field types of which the message is composed have been shown, without specifying their sizes. The precise format of a particular field can be adapted to suit a specific solution.

(22) Please add the following new paragraph immediately after the last paragraph on page 17, which begins with "The most practical and ...", as follows:

The preferred embodiments having been thus described, it will now be evident to those skilled in the art that further variations thereto may be contemplated. Such variations are not to be regarded as a departure from the invention, the true scope of the invention being set forth in the claims appended hereto.

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(23) Please amend the section description for the claims on the top of page 18, as follows:

WHAT IS CLAIMED IS: ~~CLAIMS~~